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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,840	09/05/2003	William A. Moffatt	1008-US	8406

7590 10/10/2008

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EXAMINER	
STOUFFER, KELLY M	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
10/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/656,840	MOFFATT ET AL.	
	Examiner	Art Unit	
	KELLY STOUFFER	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-23 and 25-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-23 and 25-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 21 April 2008 have been considered but are moot in view of the new ground(s) of rejection. Though the new grounds of rejection are somewhat necessitated by amendment, it was also found that the applicants' arguments were convincing and warranted a new grounds of rejection. Therefore, as a courtesy, this office action is non-final.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 20-23, 25-40, and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. (US 6,136,725) in view of Hill et al. (GB 2107360 A)

Loan teaches a method in which a CVD process if performed in a process chamber. The reactants are fed into vaporizations chambers prior to being fed into the process chamber (abstract). Each reactant may have its own vaporizer chamber (column 5, lines 30-36). The pressure is adjusted for each process step (column 13, lines 22-39). This reads on the second pressure being higher or lower than the first pressure. The inert gas is taught (column 7, lines 60-67). Silane is taught to be one of the reactants (column 2, lines 5-15).

Loan et al. teaches supplying a first chemical to a process chamber to coat the substrate with a first chemical as follows. Loan et al. describes a precursor being delivered to a substrate in a pure form and limiting decomposition of the precursor (column 3 lines 38-65). One of ordinary skill in the art would recognize that if it were desirable, that it would be obvious to use this method to deposit the precursor on the substrate using the method of Loan et al. to create a film of the precursor. It is also noted that during a CVD process, it is common that the precursor may be deposited on the surface of the substrate to react with another precursor, therefore forming the resultant film. This would still include the chemical that was the precursor, and therefore still reads on this limitation.

Though Loan teaches that a section of the chamber is dehydrated (column 15 lines 49-67 and column 16 lines 1-6), Loan does not require dehydrating a substrate before coating as now claimed. Hill et al. teaches inserting a substrate and dehydrating

it with heated inert gas and vacuum pumping the chamber before coating in lines 105-127 in order to remove any water vapor or water before being coating with silicon. Therefore, it would have been obvious to one of ordinary skill in the art to modify Loan to include dehydrating the substrate as taught by Hill in order to remove water (ie impurities) from the substrate surface before coating.

As to claims 27 and 49, Hill et al. teaches using Argon and hydrogen and Loan et al. teaches using Argon rather than nitrogen claimed. It is the examiner's position that it is well known in the art to substitute nitrogen with argon and/or hydrogen, as they both possess the same function as an inert gas in CVD processes. The claim would have been obvious because the substitution of one known element for another (i.e. nitrogen for argon and/or hydrogen) would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR International Co. v. Teleflex Inc.,* 550 U.S.--, 82 USPQ2d 1385 (2007). See Bunshah et al. "Deposition Technologies for Films and Coatings: Developments and Applications" page 339 et seq. for further support.

As to claims 23 and 47, Loan and Hill teach the limitations above, but are silent to the reservoir being the manufacture's source bottle. However, it is explicitly taught that the chemicals used as the precursors have a low vapor pressure (low tendency to evaporate under atmospheric pressures) (column 2, lines 30-40). It is also taught that the invention is not sensitive to gas or solids that may get absorbed into the chemicals

(column 1, lines 40-67). From this, one of ordinary skill would understand that no special reservoir is required for the process. Additionally, since chemicals would come from the manufacturer already in a container that is suitable for holding the specific chemical, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the manufacturer's own source bottle in the process taught by Loan and Hill. By doing so, one would have a reasonable expectation of success, as Loan makes obvious that no special reservoir is required and the manufacturer would already provide a bottle that is suitable for holding the specific chemical contained within.

Claims 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. in view of Hill et al. as applied to claims above, and further in view of the applicant's admitted prior art.

Loan and Hill teaches that the process above is pertinent for reactants with low volatility, but is silent to using amino silanes and other specific silanes claimed by the applicant. However, the applicant admits that it is well known in the art to deposit amino, mercapto, or epoxy silanes to glass substrates and that the reactants have low volatility (paragraph 10). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the reactants is substrates claimed by the applicant in the process taught by Loan and Hill. By doing so, one would have a reasonable expectation of success, as the process taught by Loan is best for low

volatile reactants and the applicant admits that these reactants are known and have low volatility.

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. in view of Hill et al., as applied to claims above, and further in view of Uhlenbrock et al. (US 6,214,729 B1).

Loan and Hill teach the limitations above, but are silent to using a syringe pump. However, Uhlenbrock teaches the art recognized suitability of using a syringe pump to pick up the liquid feed and deliver it to a vaporizer (figure 1; example 1). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a syringe pump in the process taught by Loan and Hill. By doing so, one would have a reasonable expectation of success, as Loan teaches delivering a liquid to a vaporizer and Uhlenbrock teaches the art recognized suitability of using a syringe pump to do so.

Claims 20-23, 25-40, and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. (US 6,136,725) in view of Masaya (JP 04-154953)

Loan teaches a method in which a CVD process if performed in a process chamber. The reactants are fed into vaporizations chambers prior to being fed into the process chamber (abstract). Each reactant may have its own vaporizer chamber (column 5, lines 30-36). The pressure is adjusted for each process step (column 13, lines 22-39). This reads on the second pressure being higher or lower than the first

pressure. The inert gas is taught (column 7, lines 60-67). Silane is taught to be one of the reactants (column 2, lines 5-15).

Loan et al. teaches supplying a first chemical to a process chamber to coat the substrate with a first chemical as follows. Loan et al. describes a precursor being delivered to a substrate in a pure form and limiting decomposition of the precursor (column 3 lines 38-65). One of ordinary skill in the art would recognize that if it were desirable, that it would be obvious to use this method to deposit the precursor on the substrate using the method of Loan et al. to create a film of the precursor. It is also noted that during a CVD process, it is common that the precursor may be deposited on the surface of the substrate to react with another precursor, therefore forming the resultant film. This would still include the chemical that was the precursor, and therefore still reads on this limitation.

Though Loan teaches that a section of the chamber is dehydrated (column 15 lines 49-67 and column 16 lines 1-6), Loan does not require dehydrating a substrate before coating as now claimed. Masaya teaches inserting a substrate and dehydrating it with nitrogen and vacuum pumping the chamber before coating in the abstract in order to create a film excellent in adhesive strength. Therefore, it would have been obvious to one of ordinary skill in the art to modify Loan to include dehydrating the substrate as taught by Masaya in order to create a film excellent in adhesive strength.

As to claims 23 and 47, Loan and Masaya teach the limitations above, but are silent to the reservoir being the manufacture's source bottle. However, it is explicitly

taught that the chemicals used as the precursors have a low vapor pressure (low tendency to evaporate under atmospheric pressures) (column 2, lines 30-40). It is also taught that the invention is not sensitive to gas or solids that may get absorbed into the chemicals (column 1, lines 40-67). From this, one of ordinary skill would understand that no special reservoir is required for the process. Additionally, since chemicals would come from the manufacturer already in a container that is suitable for holding the specific chemical, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the manufacturer's own source bottle in the process taught by Loan and Masaya. By doing so, one would have a reasonable expectation of success, as Loan makes obvious that no special reservoir is required and the manufacturer would already provide a bottle that is suitable for holding the specific chemical contained within.

Claims 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. in view of Masaya as applied to claims above, and further in view of the applicant's admitted prior art.

Loan and Masaya teaches that the process above is pertinent for reactants with low volatility, but is silent to using amino silanes and other specific silanes claimed by the applicant. However, the applicant admits that it is well known in the art to deposit amino, mercapto, or epoxy silanes to glass substrates and that the reactants have low volatility (paragraph 10). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the reactants is substrates

claimed by the applicant in the process taught by Loan and Masaya. By doing so, one would have a reasonable expectation of success, as the process taught by Loan is best for low volatile reactants and the applicant admits that these reactants are known and have low volatility.

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. in view of Masaya, as applied to claims above, and further in view of Uhlenbrock et al. (US 6,214,729 B1).

Loan and Masaya teach the limitations above, but are silent to using a syringe pump. However, Uhlenbrock teaches the art recognized suitability of using a syringe pump to pick up the liquid feed and deliver it to a vaporizer (figure 1; example 1). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a syringe pump in the process taught by Loan and Hill. By doing so, one would have a reasonable expectation of success, as Loan teaches delivering a liquid to a vaporizer and Uhlenbrock teaches the art recognized suitability of using a syringe pump to do so.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KELLY STOUFFER whose telephone number is (571)272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer
Examiner
Art Unit 1792

kms

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792